

12

EUROPEAN PATENT APPLICATION

21 Application number: 89830168.4

51 Int. Cl.⁴: **B 65 H 31/30**

22 Date of filing: 18.04.89

30 Priority: 18.04.88 IT 2023988

43 Date of publication of application:
25.10.89 Bulletin 89/43

84 Designated Contracting States:
BE CH DE ES FR GB LI NL SE

71 Applicant: **O.M.G. di GIORGIO PESSINA E ALDO PEROBELLI S.n.c.**
Via Timavo, 34
Paderno Dugnano (Milano) (IT)

72 Inventor: **Perobelli, Aldo**
Via Donizzetti, 5
Cusano Milanino (Milano) (IT)

Pessina, Giorgio
Via Adda, 17
Cusano Milanino (Milano) (IT)

74 Representative: **Mercurio, Franco et al**
c/o Società Italiana Brevetti S.p.A. Via Carducci, 8
I-20123 Milano (IT)

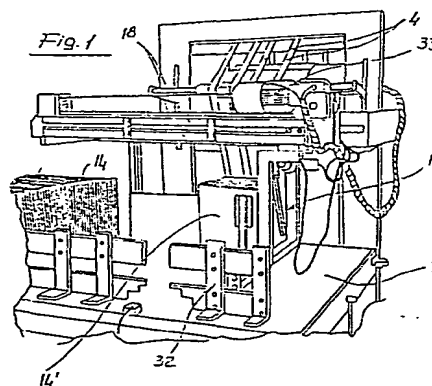
54 Continuous signature stacker machine provided with a special device for transversely ejecting the assembled package.

57 There is described herein a continuous signature stacker machine, which is provided with a transversely operating, assembled package ejecting device.

Said stacker machine substantially includes a platform whereon individual signatures are sequentially fed while lying on one edge thereof, in order to form a predetermined length package.

The latter is subsequently traversed, in a direction across said platform, by means of an ejecting device provided on purpose, being thereby directly transferred on a manual processing platform, or on the platform of another machine, for a subsequent processing to be done on the package (such as, for instance, automatic or manual pressing and tying up), or on the processing platform of a strap applying machine. In particular, the signature package, while building up, is opposed, at the forward moving front thereof, by a slide member set in motion by a pair of chains provided on the sides thereof.

Furthermore, said slide member can be automatically recalled, after the package has been formed and subjected to the traverse motion, to an opposing position relative to a new package which is building up.



EP 0 339 002 A2

Description

CONTINUOUS SIGNATURE STACKER MACHINE PROVIDED WITH A SPECIAL DEVICE FOR TRANSVERSELY EJECTING THE ASSEMBLED PACKAGE

The subject of this invention is a continuous signature stacker machine, provided with a special device for transversely ejecting the assembled package. As it is already known, the signatures coming out of folding machines are usually collected into packages in order to be then transferred to other bookbindery machines.

It is also known that said collecting operation is conventionally performed by means of special signature stacker machines, which are in general operated to set a certain number of signatures adjacent to each other, in order to form a "package", wherefrom said signatures are picked up manually in small parcels.

In any case the machines presently used for said purpose are rather complicated as far as their structure is concerned, and they are not always geared to continuous operation.

Furthermore, said conventional machines, usually require important modification and setup operations for any variation of the dimensions of the signatures to be stacked.

An object of this invention is to overcome the previously mentioned drawbacks, by providing a signature stacker machine which doesn't require any interruption of operations during the process of picking up the assembled package.

Within the scope of the task mentioned above, a particular object of this invention is to provide a signature stacker machine which is very reliable and of a simple construction.

A further object of this invention is to provide a signature stacker machine which allows different size signatures to be handled, with minimum adjustments.

The above task, as well as the objects mentioned above, and further objects which might become more apparent in the following, are achieved in a signature stacker machine according to this invention, characterized in that it substantially includes a platform, whereon the individual signatures are sequentially fed resting on the edge thereof, in order to progressively assemble a predetermined length package which is then transferred across the platform, in a transverse direction, by means of a special ejecting device, which is adapted to transfer said package directly on the platform of a further machine (for instance a strap applying machine); in particular, the package of signatures being assembled is opposed, at the forward moving front thereof, by a slide member, driven by a pair of chains and automatically repositionable, after the package has been formed and transferred, to an opposition location relative to a new package being formed.

Further features and advantages of the signature stacker machine which makes the subject of this invention Patent will be better understood from the following description of a preferred embodiment of the subject machine shown, for purely exemplary and non limiting purposes, in the Figures of the

attached drawings, wherein:

Figure 1 shows a schematic perspective view of the subject machine;

Figures 2 and 3 show a pair of devices provided in sequence on the machine, and comprising an actual part of the machine;

Figure 4 shows a rear view of the subject machine, a strap applying machine being located on the side thereof, and suitably connected thereto;

Figure 5 shows the platform of the subject stacker machine;

Figure 6 shows a step in the formation of the package of signatures;

Figures 7, 8 and 9 show schematically the ejection sequence of said package;

Figure 10 shows a mechanism adapted to interrupt, in a predetermined position, the motion of the signature package ejecting device;

Figures 11 and 12 show in a perspective view, and in a schematic respectively, a mechanism adapted to block said ejecting device if the same is not correctly positioned, relative to the signatures placed side by side, or in the case some unpredictable problems take place during the translation of said device;

Figure 13 shows an apparatus adapted to control the motion of the driving chains for the slide member and for the signatures;

Figure 14 shows schematically a withdrawal device for a formed and strapped package.

Referring now in particular to the reference numbers of the various Figures of the attached drawings, the subject signature stacker machine includes a roller feeder, shown in general at (1), with a press station provided downstream thereof, said station comprising a plurality of mutually opposed rollers (2).

Said mutually opposed rollers are provided to subject the signatures (3) already folded and fed by an upstream folding machine, to a suitable pressure for the purpose of ejecting air from said signatures flattening them further, in order to improve the folding situation thereof.

Said signatures, processed as above, are subsequently picked up by a belt system (4) which is adapted to give them a fish scale like arrangement and to forward them vertically upwards along a stretch 5.

From the upper end thereof, said signatures are transferred downwards (still under the action of the belt system mentioned above) while resting on the edges thereof, and they slide along the vertically downwards stretch, whereupon they get arranged in a vertical position along a sliding platform (7).

In the central area of said platform chains (8) are provided, sliding at a certain distance apart, and winding around driving sprockets and idle sprockets.

Concerning the latter it should be pointed out that said chains are slightly projecting relative to the platform, and they move forward those signatures which, under the action of gravity, come to rest on the top portion of their links.

Furthermore, said pairs of chains drive the forward motion of a slide member (9), hooking up to one of their links by means of cogs arranged underneath a pair of small L-shaped arms, shown at (10), pivoted at (11) around a horizontal axis, at the base of said slide member.

In addition, said small arms are provided, on the vertical of their pivoting axis, with a further small upwards extending arm (12) which carries, at the top thereof, a small coaxial idle wheel (13).

A pressure action is established on said pairs of small wheels by the various signatures being deposited on the platform, which gradually form a package (14) having a progressively increasing thickness.

In particular said package, by pushing on the small wheels mentioned above, causes a slight downward rotation of small arms (10) whereby the lower cogs thereof get into meshing engagement with a corresponding number of links of chain (8).

The meshing engagement of said small cogs can be obtained as well by means of an electromagnet, or of a small pneumatic cylinder or the like.

Slide member (9) is provided, at the front side thereof, with an adjustable screw (15) which, once said slide member has reached a predetermined limit position, is controlled to actuate a microswitch (16) which, in turn, actuates a package ejection device, indicated in general at (17).

Said ejecting device, is generally supported by a moving frame, adjustable on a stationary frame provided for the purpose. Said design arrangement allows the package to be ejected at both sides of the machine, without having to resort to complicated adjustment and control operations.

Furthermore, said design approach eliminates any projection out of the machine outline, both during manual withdrawal of the signatures and during automatic ejection thereof.

According to a preferred embodiment, the ejecting device is comprised of sliding rails (18) arranged transversely relative to said pair of chains (8), and adapted to form translation guides or seats for pairs of small diameter rollers (19).

The latter support a carriage (20), which in turn carries two vertical arms shown at (21), connected by a lower horizontal cross member (22) which is in turn provided, at the ends thereof, with corresponding pivoting arms (23).

Of said pivoting arms, the one facing towards the inner area of the platform is linked, by means of a first rod (24), to a lever (25), whose power receiving end is driven by a second rod (26) comprising the reciprocating armature of an electromagnet (27), or by an equivalent member.

Furthermore, the arm mentioned above is provided, at the free end thereof, with at least a small roller (28) adapted to slide with the lowest possible friction, against the signatures, at the moment when the package is being ejected.

Underneath said small roller there is provided, at both sides of the ejecting device, a small plate (29) whose function is to contain the package to be ejected, separating the same from the various other signatures which are meant to form a following package (14').

On the side of said platform inner chain there is provided a vertically projecting member (30) carrying, at different heights, two or more separator blades (31) arranged stepwise at the package ejection side.

More particularly, said projecting member which is provided as well with a package holding plate, is fastened to the machine upper platform, and is comprised of mutually telescoped members. Said feature substantially makes member (30) constantly adjustable close to a side of the package, regardless of the size of the latter; furthermore, it allows said adjusting operation to be performed keeping to a minimum the room between the stacker machine and the following package processing station. In practice, said blades prevent an incorrect ejection of the signatures located in an intermediate position between package (14) to be ejected and package (14') being newly collected on platform (7).

Of course, at the front end of the latter there is provided a properly adjustable guide or barrier member (32) adapted to retain the package of signatures, until the moment it is ejected.

Said ejecting device (17) is suitably driven by a geared motor (33), by means of cogged belts, chains or equivalent transmission means.

In particular, said transmission belts or chains are fastened, at one end thereof, to a connection point whereat a towing action is applied to carriage (20).

Obviously, the ejecting device mentioned above may be driven, in alternative, also by pneumatic cylinders, or by other functionally similar members which, in any case, are adapted to provide the traverse movement of said carriage and of arms (21) carried thereby.

It should be pointed out as well that said ejecting device stops, after a predetermined stroke (see Figure 8), so that, while a part of a package is being ejected, a retaining action is maintained upon the package being formed, while slide member (9) is coming back, for retaining purposes of the forming package.

Said slide member return stroke is substantially made possible in that the cogs hooking the latter to chains (8) automatically disengage therefrom since there vanishes the pressure applied, on the upper part of said slide member, by said package of signatures, said disengagement being also possibly controlled by an electro-magnet, or by a cylinder, or by means of a cam slide.

Said disengagement enables the slide member to move back, along said slide member guiding rail (34), under the return action provided, through a cable, by a weight subjected to the force of gravity, or by a motor driven return arrangement.

For stopping carriage (20) and the ejecting device carried thereby, there is provided a small plate (35), projecting out from both vertical arms (21) and adapted to come into engagement with a micro-

switch (36) located in a proper position on guide rails (18).

In practice, since in general in the stacker apparatus the signatures are stacked at the central position of the stacking section, the adjustable frame carrying the ejecting member will be positioned close to an end of the package being formed.

Once the package has been completed, or in any case it is located close to barrier (32), a sensor which will be described more particularly in the following, speeds up the package forwarding chains, in order to relieve the pressure of the packaged signatures and to assist both the stacking up of the incoming signatures and the proper separation of the signatures proceeding to ejection from the ones remaining on the stacker, as well as the package ejecting operation.

In particular, the package ejecting operation takes place after the above mentioned sensor (16) has been actuated, while the action of the chain speed-up sensor can be disabled or enabled according to need.

At the end of the ejection stroke, the package will be advantageously positioned in a proper way above a pressing and strap applying station, or on a manually processing station.

Said result is attainable in that the ejecting member carrying frame can slide on the stationary frame, so that for any different size signatures, the package, at the end of the ejection operation, and thereby at the moment of the binding or strap applying operation, is always located in an intermediate position obtained automatically through the proper amount of sliding of the frame.

Based on the above contrivance, it is possible to keep a constant length of the ejecting member stroke while adjusting the ejecting member carrying frame in parallel to the ejecting stroke, in order to perform unrestrained ejection from one side or the other, while keeping the self-centered package position relative to the processing station which follows the package formation stage.

Said convenient result can substantially be attained by providing an adjustable ejecting member carrying frame, having fixed positions.

It should also be pointed out that an ejecting device embodied as described above can be applied for different type stacker apparatus as well, like for instance cardboard box stacker apparatus, or stacker apparatus for brochures, leaflets, books and so on.

On the subject machine there is further provided a device adapted to stop the machine in case, for any reason, a variation of the ejecting device orientation takes place relative to the vertical plane.

Said device comprises a tube shaped body (37) positioned at right angles relative to ejecting device upper cross member (38) which is hingedly connected, on the average at pivot axis (39), to base (40) of the carriage mentioned above.

In particular, within said tube shaped body there is received a spring (41) supporting a small ball (42) which projects through an opening provided for that purpose through cross member (38), in order to engage within a matching cavity (43) provided in the

carriage base. Said small ball is provided with an extension rod (44) projecting through a suitable opening in the base of tubular member (37) and contacting, at the end thereof, a small lever (45).

The latter pivots at (46) and it is resiliently loaded through a coil spring or the like, or else by the plunger of a microswitch (47), and it is adapted to control said microswitch which is provided in turn to control the power supply to said geared motor assembly (33), or any other suitable driving means for carriage (20).

In practice, any undesirable rotation of the ejecting device around axis (39) results in a pressure being applied on small ball (42) and thereby on small lever (45), whereby said carriage is stopped.

Said ejecting device, once it has unloaded a package of signatures starts a return stroke and in said conditions pivoting arm (23) is recalled upwards by electro-magnet (27) so that it does not interfere with forming package (14').

Concerning the above, it should be pointed out that said pivoted rotatable arm (23) might be replaced as well by an arm which is either able to move back through a telescoping arrangement, or to rotate on the vertical plane.

As an alternative, an arrangement may also be provided whereby the whole ejecting carriage support frame can be moved back relative to the package forwarding direction.

In addition, it should be pointed out that the driving device for both pairs of chains (8) is driven by a gear motor unit whose rotating speed is controlled manually or in combination with the position of a vertical plane (48) provided at the location where the plurality of signatures move downwards.

Said plane is hingedly supported at the top side thereof, at horizontal axis (49), and it is connected with naturally downward biased lever (50), provided in a position approximately at right angles relative to said plane.

Said lever is in turn preferably provided with a projection forming a hooking point for the end of a spring (51) whose lower end is resiliently tied down to a suitable fastening member integral with the machine frame. Said lever is further provided with a projecting chute shaped portion, shown at (52), where an electronic sensor (53) is positioned, the latter sensing the longer or shorter distance from said projecting portion, which is of course related to the different lever positions.

Substantially, said lever tends to rise or to lower according to the higher or lower pressure of the pack of signatures on vertical plane (48), thereby increasing or decreasing, accordingly, the speed of said geared motor unit, through the sensor mentioned above. Said sensor may for instance comprise a voltage divider, suitably controlled by the oscillations of vertical plane (48).

More particularly, when the signatures are conveyed on platform (7), vertical plane (48), performing as a feeler, tends to move towards the machine rear side and in so doing it varies in the proper direction the speed of the forwarding chains mentioned above.

It should also be emphasized that the stroke

length of the ejecting device supporting carriage is suitably adjustable, whereby a perfect ejection of the signatures is provided, for any different size thereof. Said signatures, after having been ejected, land on the platform of a strap applying machine (54) known per se, where the packages are tied up by means of straps, webs, ropes and so on.

In particular, provision is made so that said strap applying machine is connected, at the rear edge of the sides thereof, to the corresponding side of the subject machine, by means of hinged connections (55).

In practice, said feature enables a suitable hoisting and transferring apparatus generally shown at (56), to be positioned directly in contact with said side-by-side paired machines, with a swinging arrangement, said apparatus being adapted to pick up signature packages from the strap applying machine and to load them on pallets or like means, according to need.

More precisely, said hoisting apparatus is provided with gravity actuated tongs (which are simple and cost effective concerning both construction and handling), carrying, on the pantograph arms thereof two adjustable levers (57), having rollers associated with one end thereof.

The latter, when touching the package of paper, make it possible to adjust the height at which the tongs come into engagement with the package and the sliding of the pantograph arms in contact with the latter when the package is automatically disengaged from the tongs once, in its downwards travel, it is laid down where desired.

On said tongs there is provided a bar pivoted on the pantograph levers, at the one end, while at the other end of lever (58) there is provided an L-shaped slot.

When the pin provided on one of the pantograph arms comes into engagement with the highest position in said slot, the above arrangement allows the tongs to stay in the open position. Obviously, said condition takes place in that the weight of the pantograph arms acts on the upper part of the slot, providing sufficient pressure to prevent the pantograph levers from getting closer to each other, and therefore to close.

Vice versa, when the rollers of arms (57) bear on the package, the pressure of the pantograph arms on the upper end of the L-shaped slot goes down to zero, whereby lever (58) may be lifted by means of handle (59) integral therewith. At this point the pantograph tongs can enclose the package if the hoist is actuated for lifting, in that pin (60) may slide in the lower portion of the L-shaped slot.

Actuation of lever (58) may be performed also automatically, by means of a pneumatic cylinder, an electro-magnet, or any other functionally equivalent device. Concerning the above it should be pointed out that, the heavier the package to be lifted, the stronger is the closure force.

Furthermore, said handle (59) is advantageously provided both for actuating lever (58) and for displacing the tongs on the swinging hoist and for correctly laying the package on a pallet, on a platform, or anywhere it is desired.

5

10

15

20

25

30

35

40

45

50

55

60

65

When the package, during the lowering step thereof, comes into engagement with the desired support plane, rollers (57) come to rest on said package, the pantograph levers slide outwards causing the tongs to open, lever (58) goes into engagement with the top portion of the L-shaped slot, and pin (60) integral with the pantograph lever, causes the automatic opening and keeps said tongs in the open position.

From what has been described above, and from observation of the Figures of the attached drawing, there distinctly shows the higher functionality and usage convenience characterizing the signature stacker machine subject of this Invention Patent.

It should be understood that said machine has been described and illustrated above for purely exemplary and non limiting purposes, with the only purpose to prove the practical feasibility and the general features of this Invention, whereby to the same there may be made all those variations and modifications occurring to those skilled in the art, and included in the scope of the inventive concepts described above.

Claims

1. A signature stacker machine, characterized in that it substantially comprises a platform whereon the individual signatures are sequentially fed while resting on the edge thereof, in order to progressively build up to a package having a predetermined length, which is subsequently transferred, in a transverse direction of said platform, by means of a special ejecting device, which is adapted to transfer said package directly onto the processing platform of a following machine (a strap applying machine, for instance); in particular the forming signature package is opposed, at the forwarding front thereof, by a slide member, actuated by a pair of chains, and adapted to be automatically recalled, once a package has been formed and transferred, to an opposing position against a new package being built up.

2. The signature stacker machine of the previous Claim, characterized in that it includes, upstream from said platform, a roller conveyor with a pressing station located downstream thereof, said pressing station comprising an array of opposed cylinders; said opposed cylinders are provided to subject to a suitable pressure said already folded signatures, which are fed by an upstream located folding machine.

3. The signature stacker machine of the previous Claims, characterized in that, downstream from said array of opposed cylinders there is provided a belt system adapted to arrange the signatures in fish-scale like position while forwarding them upwards along a vertical stretch, and from the top end thereof said signatures are transferred downwards, while resting on their edge, sliding along a downcoming vertical stretch, in order to get arranged, still in a vertical position, along said platform.

4. The signature stacker machine according to one or more of the previous Claims, characterized in that in the central portion of said platform moving chains are provided, said chains sliding at a predetermined mutual distance, said chains being subtended between towing sprockets and idle sprockets; said chains in particular project slightly above the platform, and are adapted to cause forward motion of the signatures.

5. The signature stacker machine according to one or more of the previous Claims, characterized in that said pairs of chains control the forwarding of a slide member, hooking up to a link thereof by means of cogs provided underneath a pair of L-shaped small arms, pivoting around a horizontal axis, at the base of said slide member; said small arms are provided, on the vertical of their pivot axis, with a further upward extending small arm carrying, at the top end thereof, a small idle roller, coaxial therewith.

6. The signature stacker machine according to one or more of the previous Claims, characterized in that said slide member is provided, at the front side thereof, with an adjustable screw for the purpose of actuating a microswitch adapted in turn to cause the actuation of a suitable ejecting device, when said slide member has reached a predetermined limit position.

7. The signature stacker machine according to one or more of the previous Claims, characterized in that said ejecting device comprises slide rails - transversely positioned relative to said pair of chains - providing a traversing guide or seat for pairs of small rollers; the latter support a carriage provided with two vertical arms connected by a lower horizontal cross member which is in turn provided, at both ends thereof, with as many pivoted arms.

8. The signature stacker machine according to one or more of the previous Claims, characterized in that, of said pivoted arms, the one facing inside the platform is hingedly connected, by means of a first link, to a lever whose power receiving end is in turn hingedly connected to a second rod, comprising the movable armature of an electromagnet - or any other equivalent member providing an actuating pull; said arm, pivoted and capable of being turned both in a horizontal and in a vertical plane, might as well be replaced by an arm adapted to back-up by means of a telescoping arrangement; furthermore, said arm carries, at the free end thereof, or at both ends thereof, at least a small roller and small plates provided to contain and to separate the package.

9. The signature stacker machine according to one or more of the previous Claims, characterized in that, on the side of the inner chain of said platform there is provided a vertical projecting member carrying, at different heights, two or more separator blades, with a

scaled arrangement and provided on the ejection side, with a function to avoid an incorrect ejection of the signatures lying in an intermediate position between the package to be ejected and a new package building up on the platform; said projecting member, which carries a package containment plate as well, is fastened to the machine upper plane and comprises mutually sliding members in a telescoping arrangement.

10. The signature stacker machine according to one or more of the previous Claims, characterized in that said ejecting device is actuated by a special geared motor unit, by means of cogged belts, transmission chains or any other equivalent transmission means; in particular, said belts or chains are connected, at one end thereof, to a fastening means provided to cause the towing action on said carriage; as it should be apparent, the same ejecting device may be driven in alternative by pneumatic cylinders, or by any other functionally equivalent means.

11. The signature stacker machine, according to one or more of the previous Claims, characterized in that said ejecting device stops, after a predetermined stroke, in such a way as to maintain control on the package being formed, while a package is being ejected, as the slide member is going back to a retaining position; the carriage bearing the ejecting device is stopped by a small plate, projecting from one of the vertical arms of the device, and adapted to come into engagement with a microswitch, suitably positioned on the carriage guide rails.

12. The signature stacker machine according to one or more of the previous Claims, characterized in that said ejecting device is mounted on a frame adjustable in a direction parallel to the ejection stroke, and the same allows the stacked package to be ejected both on the right and on the left; in particular the above mentioned adjustable ejecting device carrying frame allows for self-centering of the package, on a following processing station such as a pressing, tying, strap applying or manual unloading station.

13. The signature stacker machine according to one or more of the previous Claims, characterized in that said ejecting device may be used also on stacker apparatus for cardboard boxes, brochures, leaflets, books, and so on.

14. The signature stacker machine according to one or more of the previous Claims, characterized in that the return stroke of said slide member - which is made possible following an automatic or suitably controlled disengagement of the cogs hooking said slide member to the chains mentioned above - takes place under the return action provided, through a cable, by a weight subjected to the downward force of gravity, or by a geared motor provided for that purpose.

15. The signature stacker machine according

to one or more of the previous Claims, characterized in that it includes a mechanism adapted to stop operations in case, for any reason, said ejecting device is subjected to a change in trim in the vertical plane; preferably, said mechanism comprises a member adapted to perform a resilient action on a lever, which in turn engages with a microswitch provided on purpose.

16. The signature stacker machine of the previous Claim, characterized in that said member advantageously comprises a tubular body - fastened to the ejecting device upper cross member - which receives a spring supporting a small ball which, being inserted through an opening provided on purpose, engages into a corresponding cavity provided in the carriage base; said small ball is provided with a shank - projecting out of the suitably apertured base of said tubular body, said shank coming into engagement, at the end thereof, with the above mentioned small lever; the latter, which is suitably pivoted on a fulcrum and subjected to the force of a coil spring or the like is adapted to act on the above mentioned microswitch.

17. The signature stacker machine of one or more of the previous Claims, characterized in that the device driving the forward motion of said pair of chains is in turn operated by a geared motor unit whose velocity is controlled by the position of a vertical plane provided in the region where the plurality of signatures come down onto the machine platform; said plane is hingedly supported at the top and it is connected with a lever, controlling a device for the package forwarding chain speed self-adjustment, which has a natural tendency to lower, and is located in a position approximately at right angles to said plane.

18. The signature stacker machine of the previous Claim, characterized in that said lever is preferably provided with an arm, where an end of a spring can be fastened, which at the opposite end thereof is subtended by means of a suitable fastening member, integral with the machine frame; in addition, said lever is provided with an overhanging part carrying a chute whereat an electromagnetic sensor is positioned adapted to sense the longer or shorter distance from said overhanging portion.

19. The signature stacker machine according to one or more of the previous Claims, characterized in that on the front of said platform there is provided a guide or barrier, suitably adjustable, adapted to contain the package of signatures until the moment it is ejected.

20. The signature stacker machine according to one or more of the previous Claims, characterized in that the stroke of the carriage bearing the ejecting device is suitably adjustable, in such a way as to allow for a perfect ejection of the signatures, for any dimension thereof; said signatures, after having been

5

10

15

20

25

30

35

40

45

50

55

60

65

ejected, come to lie on the platform of a strap applying machine, known per se, which is advantageously fastened, at the rear edge of its side, to the corresponding side of this machine, by means of suitable hinged connection means.

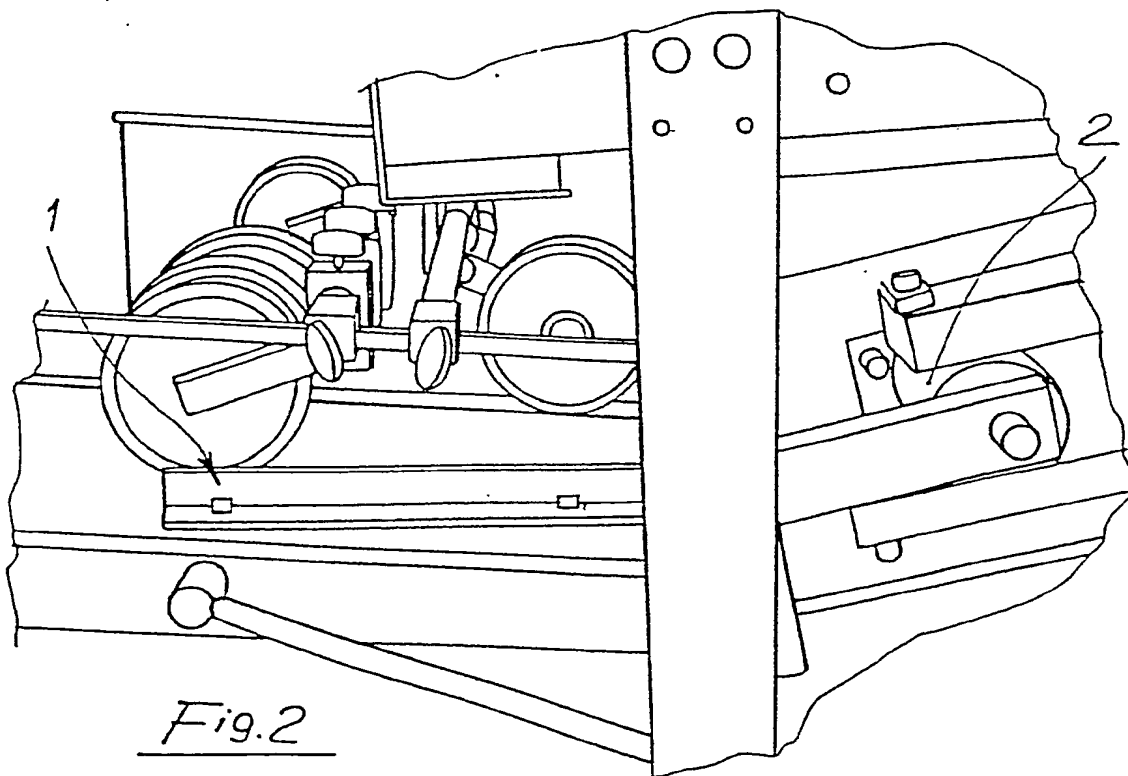
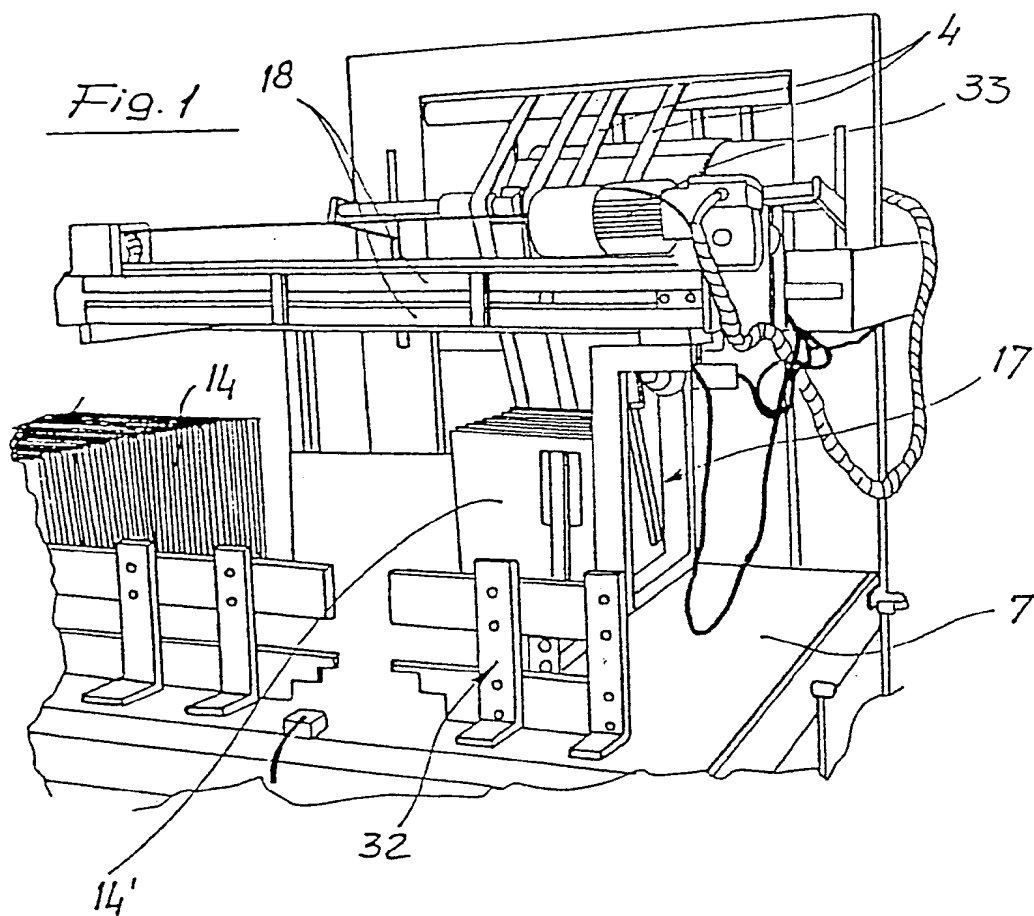
21. The signature stacker machine, according to one or more of the previous Claims, characterized in that it includes, directly in contact with said strap applying machine located side by side, and with a swinging arrangement, a suitable lifting and transferring device, adapted to withdraw the signature packages from said strap applying machine, laying the same on pallets or the like, according to need.

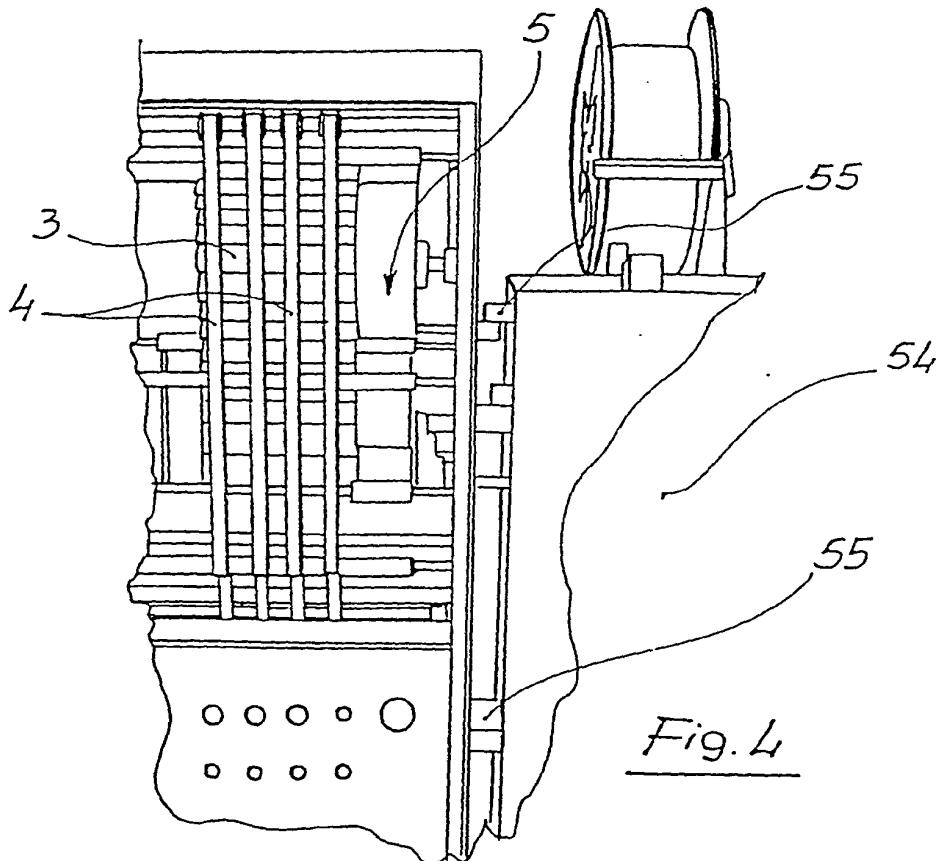
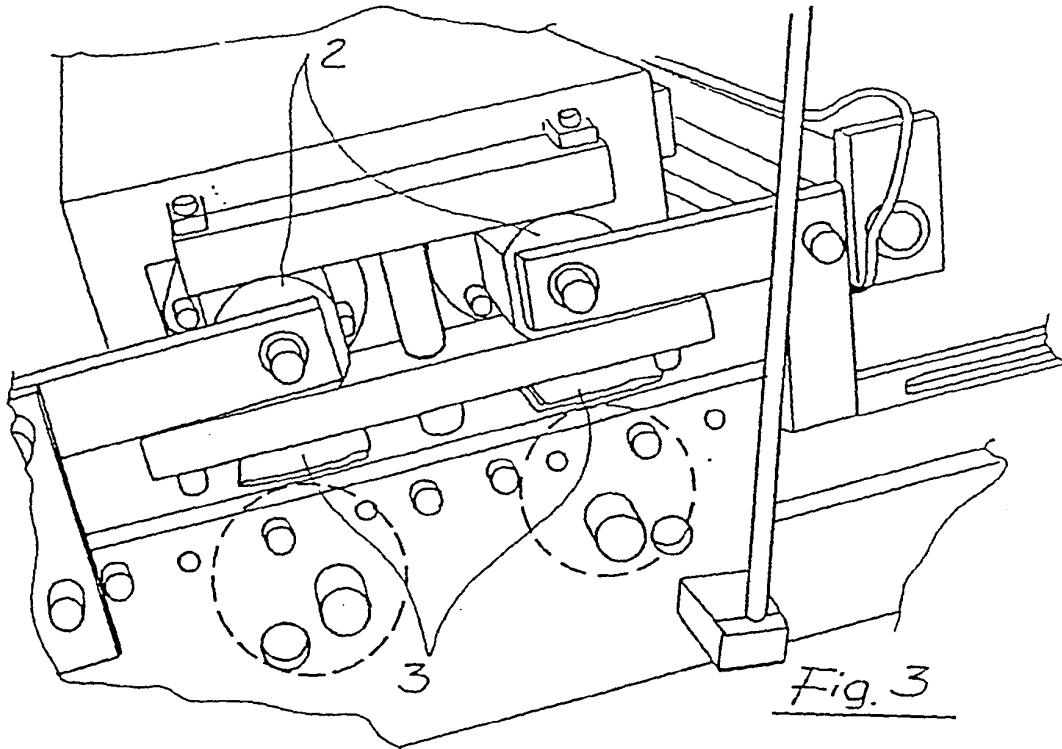
22. The signature stacker machine, according to one or more of the previous Claims, characterized in that said lifting device is provided with gravity actuated tongs which carry on the pantograph arms thereof, two adjustable levers, having rollers associated with one end thereof; the latter, when contacting the package of papers, allow for adjustment of the clamping height of the tongs on the package, and for sliding of the pantograph arms on said package, at the moment when the tongs are automatically disengaged, once the package, in the lowering thereof, has been laid down in a predetermined position.

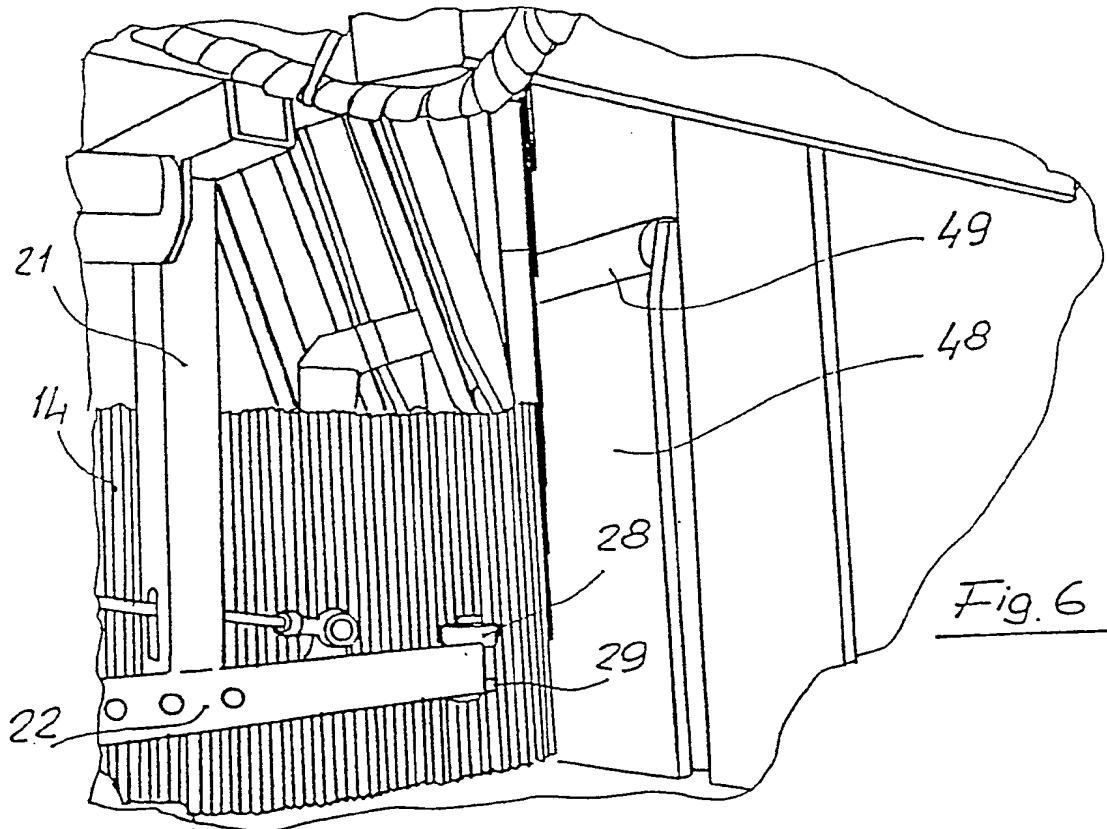
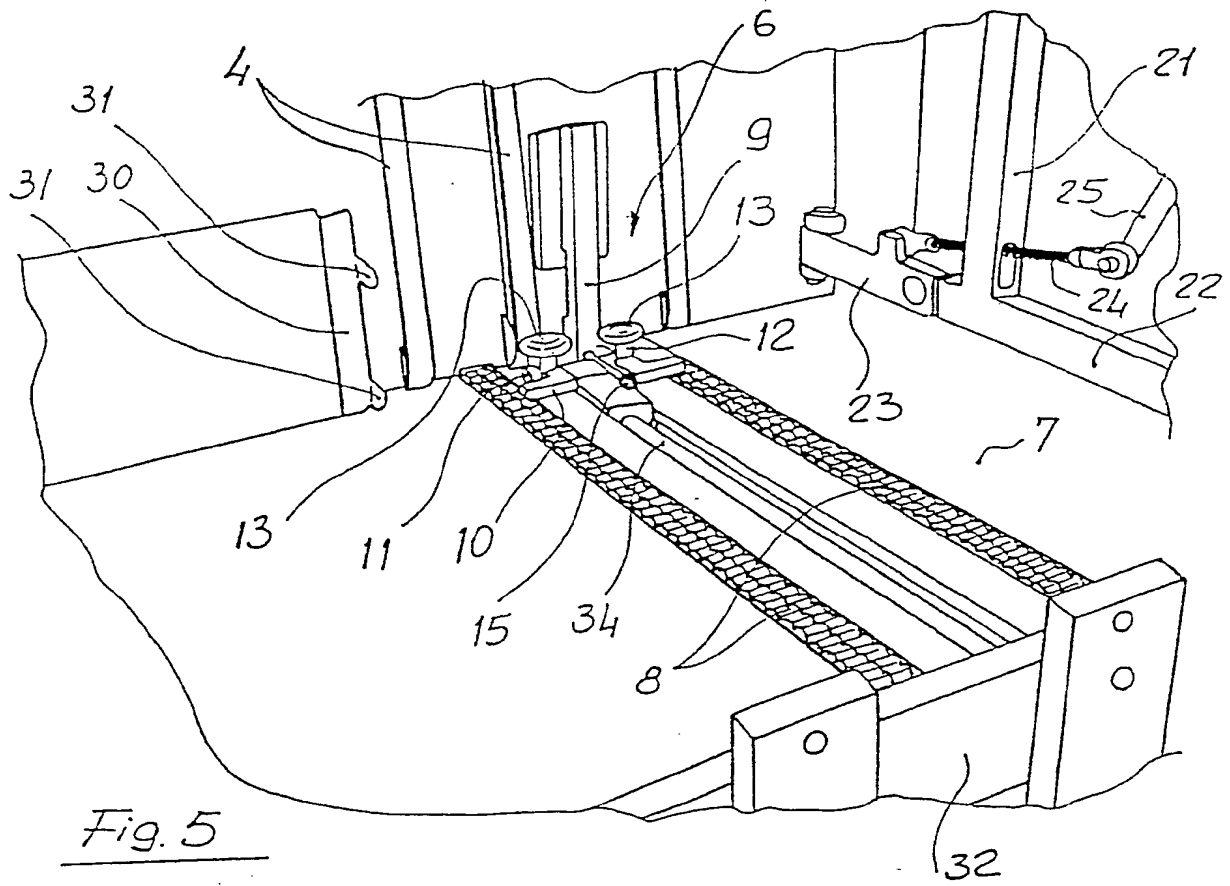
23. The signature stacker machine, according to one or more of the previous Claims, characterized in that, on said tongs there is provided a bar which, at one end is pivoted on the pantograph levers, while at the opposite end it is provided with an L-shaped slot; said shape enables the tongs to be kept in an open position, when the pin provided on one of the pantograph arms comes into engagement within the top position of said slot.

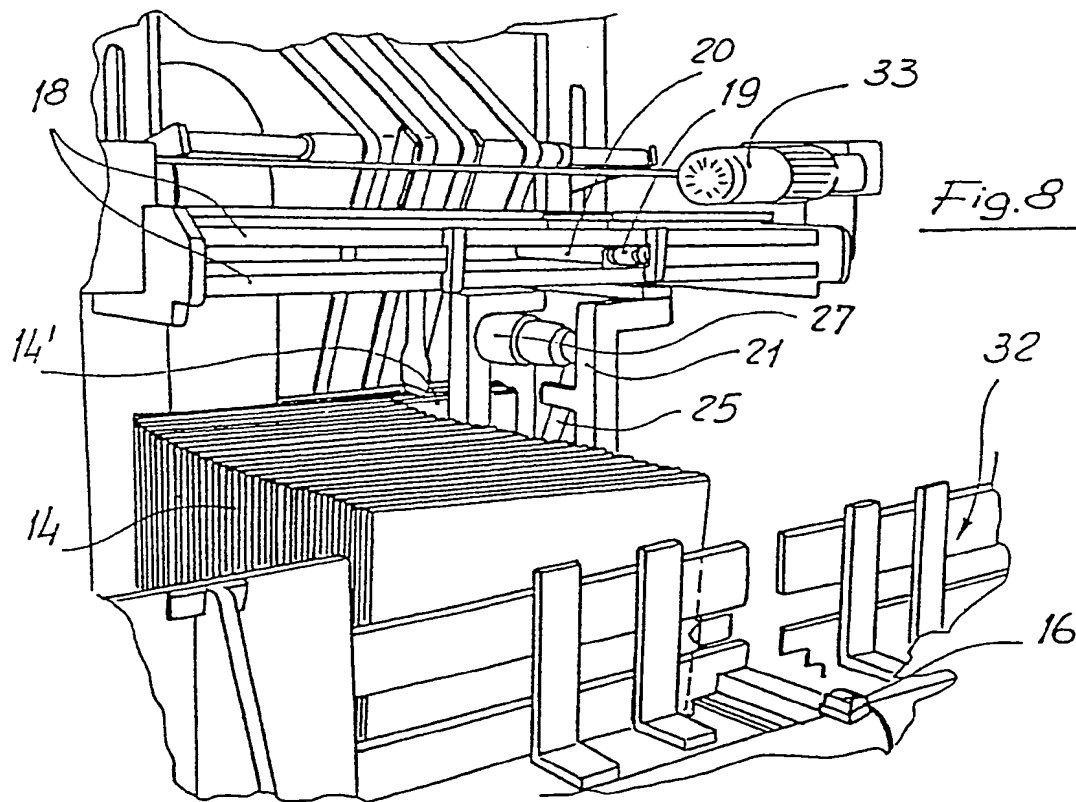
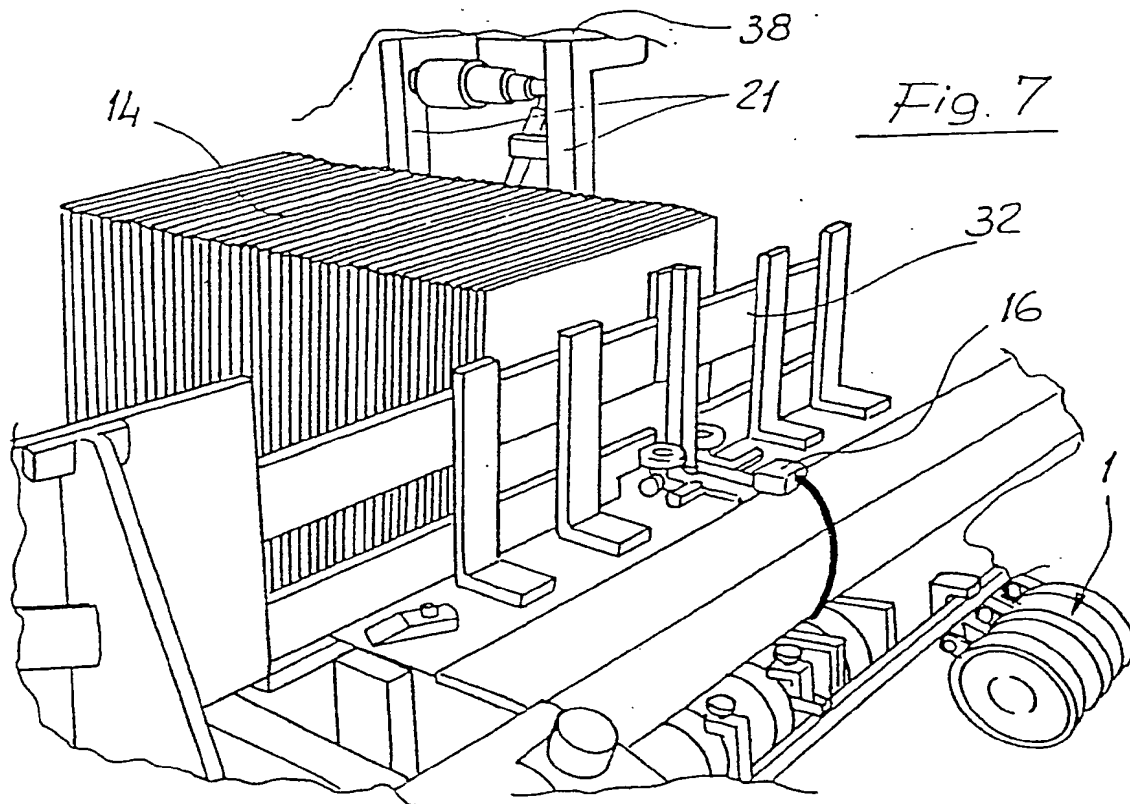
24. The signature stacker machine, according to one or more of the previous Claims, characterized in that said pantograph arms connecting bar is provided with a suitable handle, for lifting thereof; actuation of said bar may also be effected automatically, by means of a pneumatic cylinder, or by means of an electromagnet, or any other functionally equivalent member.

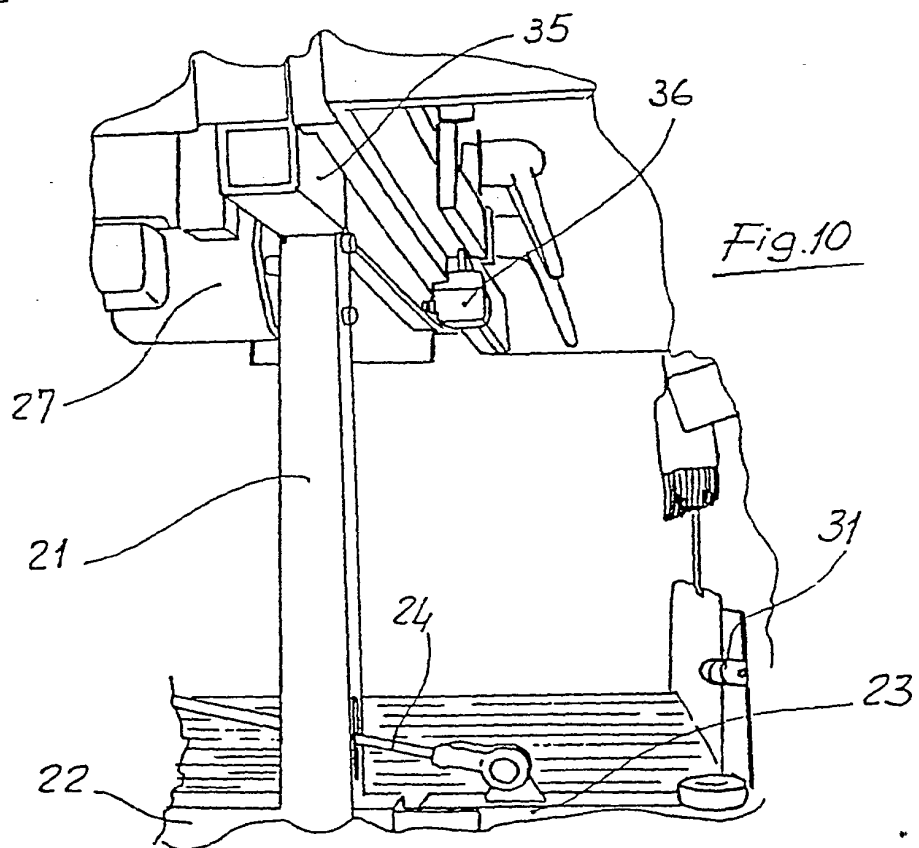
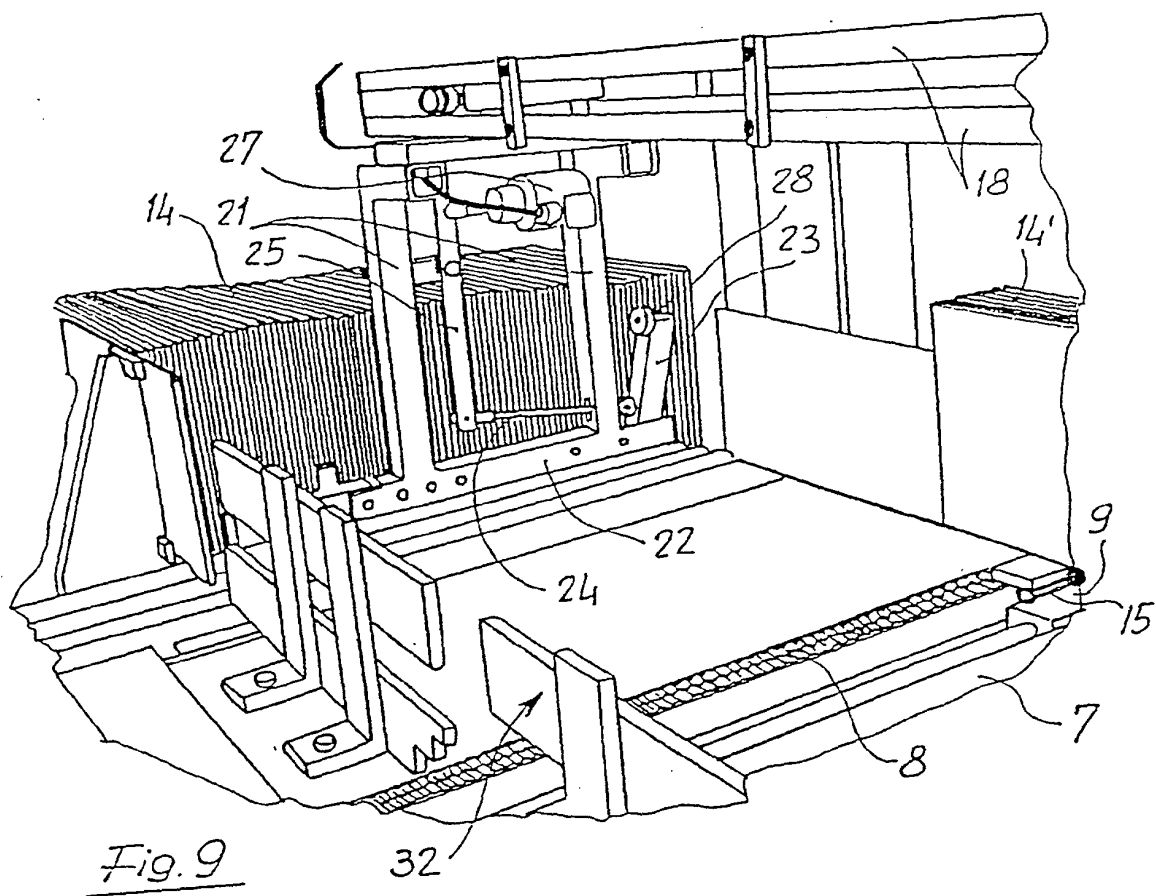
25. The signature stacker machine, according to one or more of the previous Claims, characterized by being provided with a sensor, adapted to determine the size of the package, just before said package is ejected, and to speed up the chain forward motion in said operating step.

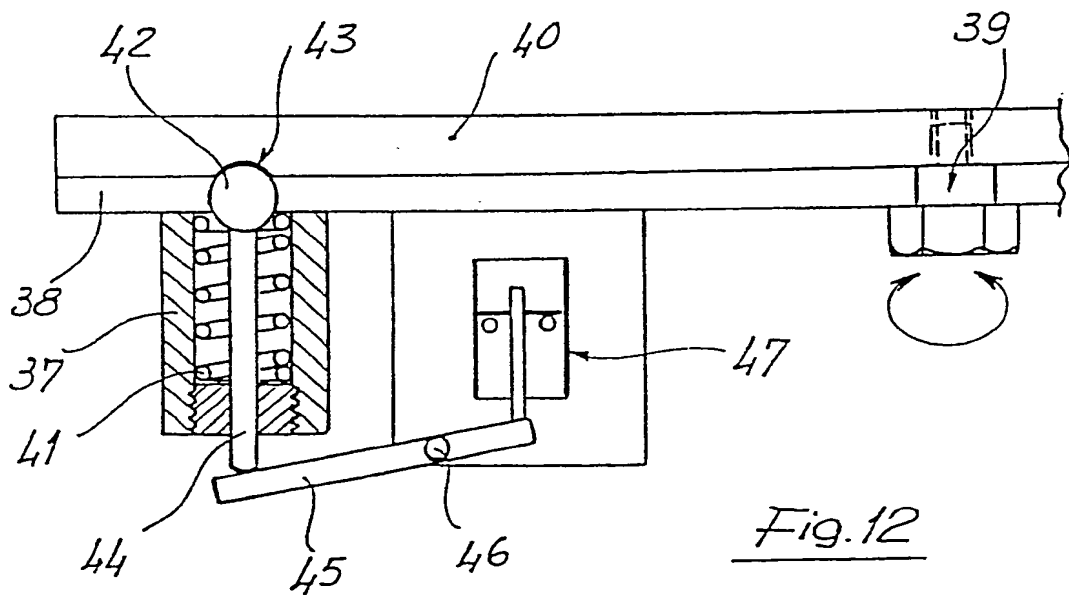
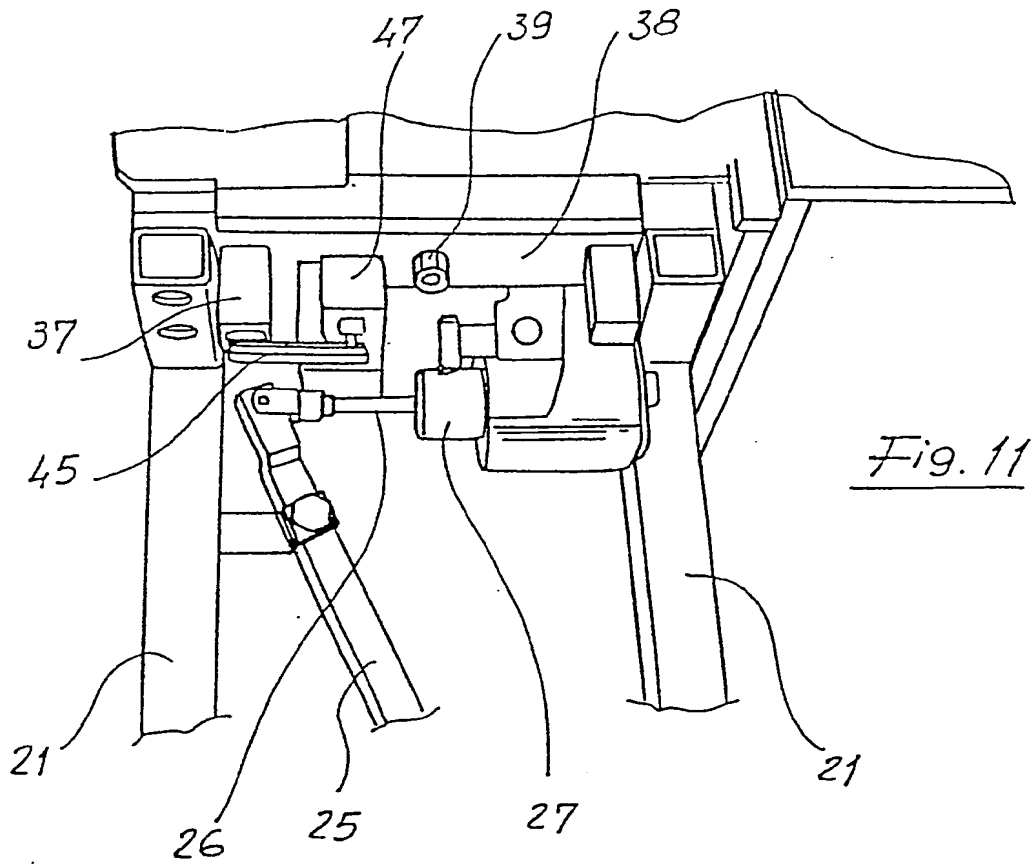


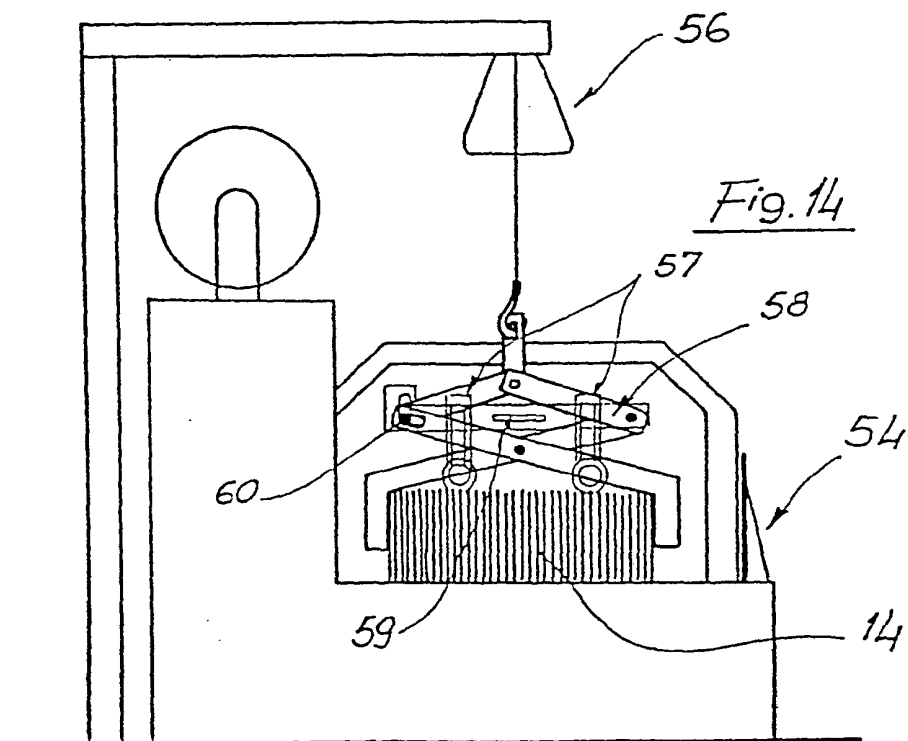
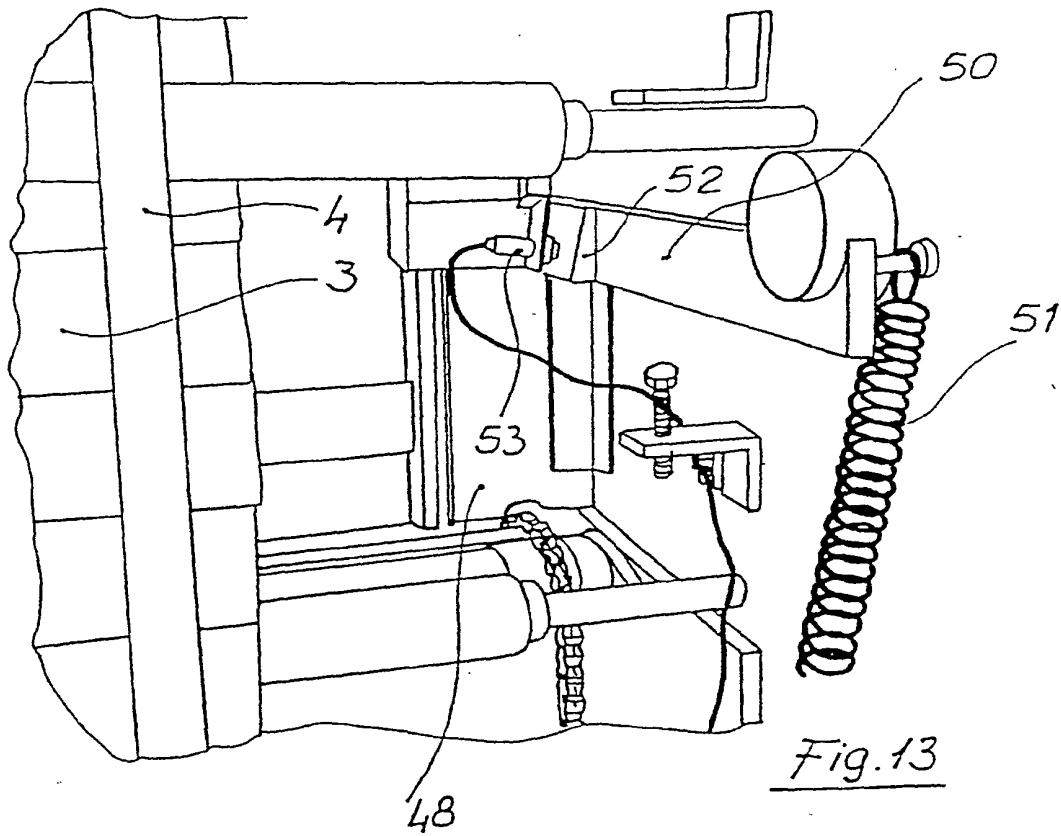














Europäisches Patentamt
European Patent Office
Office européen des brevets



Publication number:

0 339 002 A3

EUROPEAN PATENT APPLICATION

Application number: **89830168.4**

Int. Cl.⁵ **B65H 31/30**

Date of filing: **18.04.89**

Priority: **18.04.88 IT 2023988**

Date of publication of application:
25.10.89 Bulletin 89/43

Designated Contracting States:
BE CH DE ES FR GB LI NL SE

Date of deferred publication of the search report:
30.01.91 Bulletin 91/05

Applicant: **O.M.G. di GIORGIO PESSINA E
ALDO PEROBELLI S.n.c.**
Via Timavo, 34
Paderno Dugnano (Milano)(IT)

Inventor: **Perobelli, Aldo**
Via Donizzetti, 5
Cusano Milanino (Milano)(IT)
Inventor: **Pessina, Giorgio**
Via Adda, 17
Cusano Milanino (Milano)(IT)

Representative: **Mercurio, Franco et al**
c/o Società Italiana Brevetti S.p.A. Via
Carducci, 8
I-20123 Milano(IT)

54 Continuous signature stacker machine provided with a special device for transversely ejecting the assembled package.

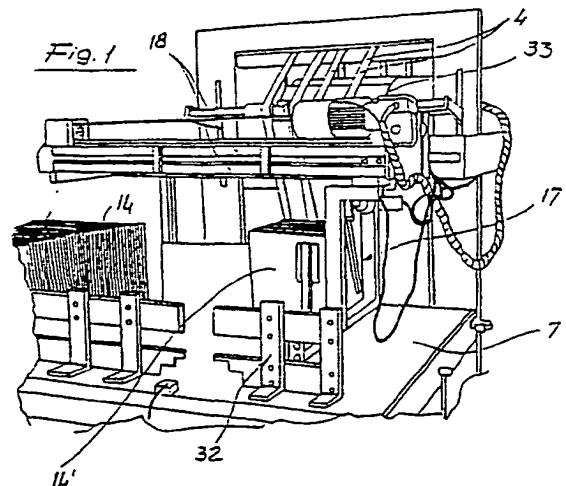
57 There is described herein a continuous signature stacker machine, which is provided with a transversely operating, assembled package ejecting device (17).

Said stacker machine substantially includes a platform (7) whereon individual signatures (3) are sequentially fed while lying on one edge thereof, in order to form a predetermined length package (14).

The latter is subsequently traversed, in a direction across said platform (7), by means of an ejecting device (17) provided on purpose, being thereby directly transferred on a manual processing platform, or on the platform of another machine, for a subsequent processing to be done on the package (such as, for instance, automatical or manual pressing and tying up), or on the processing platform of a strap applying machine. In particular, the signature package (14), while building up, is opposed, at the forward moving front thereof, by a slide member (9) set in motion by a pair of chains (8) provided on the sides thereof.

Furthermore, said slide member (9) can be automatically recalled, after the package has been

formed and subjected to the traverse motion, to an opposing position relative to a new package (14) which is building up.



EP 0 339 002 A3



European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 83 0168

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-4 058 226 (C. PETERS, JR.) " column 1, line 63 - column 3, line 45 " figures 1, 2 "	1	B 65 H 31/30
A	US-A-3 887 088 (V. FERNANDEZ-RANA ET AL.) " column 2, line 62 - column 3, line 45 " column 3, line 55 - column 5, line 65 @ figures 1-5 "	1	
P.A	US-A-4 772 003 (Y. NOBUTA ET AL.)		
A	US-A-3 865 365 (W. W. HARDIN ET AL.)		
A	GB-A-1 073 717 (DE STAAT DER NEDERLANDEN)		
A	US-A-4 172 531 (H. MÜLLER)		
A	GB-A-2 158 419 (GRAPH-A-HOLDING AG)		
A	US-A-3 772 972 (O. V. DUTRO ET AL.)		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 H B 65 B
Place of search		Date of completion of search	Examiner
The Hague		19 November 90	BOURSEAU A.M.
CATEGORY OF CITED DOCUMENTS			
X: particularly relevant if taken alone		E: earlier patent document, but published on, or after the filing date	
Y: particularly relevant if combined with another document of the same category		D: document cited in the application	
A: technological background		L: document cited for other reasons	
O: non-written disclosure		&: member of the same patent family, corresponding document	
P: intermediate document			
T: theory or principle underlying the invention			